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Psychological Monographs: General and Applied

PERSONALITY, INTELLECTUAL, AND ACHIEVEMENT PATTERNS IN GIFTED CHILDREN[1]

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ONE QUESTION that man has always asked himself is how he came to be what he is. In the present century, psychologists have approached this question from several directions; the areas of study called "learning" and "personality" are two of the most important. However, the theories and knowledge that have been developed in these areas seem inadequate when one attempts to apply them directly and with meaning to the educative process. One of our greatest needs today is to establish a set of constructs and relationships that can serve as a firm basis for educating our youth in order to utilize maximally the natural resource called human talent.

In carrying out the present research we have drawn upon the insights developed in a variety of disciplines, such as cultural anthropology, sociology, Gestalt and clinical psychology, and psychoanalysis. We drew from these sources because of our belief that, at present, no single theory or discipline provides a framework that is adequate to deal with the range of processes we set out to study. In general terms, we were interested in understanding the complex of factors associated with patterns of academic achievement in children. For example, we have endeavored to examine interrelationships among environmental pressures and controls, the developing personality structure of the children who do the learning, mental ability, and various types of academic achievement. By seeking to understand more clearly the interaction of factors relevant to the actualization of innate potential in relation to positive academic goals, we hoped to gain a clearer picture of the process of learning in the lives of the children we studied.

This report covers the first phase of a seven-year research project that was begun in 1950 in the Laboratory School at the University of Chicago. Our purpose here is to present our general procedures and findings from our study of an entire class of 76 children in Grade 3. The interrelationships among the variety of factors that we studied were traced until these children had finished Grade 9. A full report of the methodological, substantive, and theoretical findings and results of the entire study is being prepared for publication.[2]

[1] The writers are deeply indebted to the many persons who gave freely of their time and energy and in various ways helped in the planning and completion of this study. In particular, we are indebted to the three teachers who were most generous with their help: Suzanne Artingstall, Esther Oehring, and Barbara Stein; to Warren Syfert, then principal of the Laboratory School, and May McCord Tyler of the Records Office for their interest and cooperation; to R. D. Bock and J. J. Mellinger for their invaluable assistance in the statistical analysis of the data. We are also indebted to the United States Public Health Service and the Social Science Research Committee of the University of Chicago for making this research possible.

[2] This research was supported in part by the National Institute of Mental Health, United States Public Health Service, under research grant No. M-912, and by the Social Science Research Committee of the University of Chicago. A general report covering some aspects of this research project and an enumeration of subsequent studies is described elsewhere (Haggard, 1957). The material presented in this monograph is based on unpublished dissertations by two of the authors (Cummins, 1952; d'Heurle, 1953).

Although many previous studies have sought to relate various personality, mental, and situational factors to academic achievement, there has been little, if any, prior work reported which considers such effects and interrelationships in concert. For example, the concept of motivation has often been used in studying the relation between personality and learning, and many attempts have been made to relate strength of motivation or drive to what or how much is learned. But such attempts have been limited to the study of isolated determinants in rather restrictive situations. The present project departs from the majority of studies in this area in that it seeks to delineate the organization or structure of a variety of factors that determine patterns of academic learning.

In formulating this project, we have assumed throughout that human behavior is motivated and have sought to establish the organization of motivational or personality factors that regulate both the individual's perceptions of his world and his modes of relating to it. We have also assumed that each individual's personality structure tends to become stabilized in relation to the particular physical-social-cultural context in which he finds himself. Academic learning, then, is seen as an expression of one way the individual learns to utilize his energies—given certain innate potentials and a particular pattern of socializing pressures.

On the basis of these assumptions, we have sought answers to the following broad questions: (*a*) What effect do parental pressures have on the developing personality structure of the child? (*b*) What personality characteristics are associated with a high level of general academic achievement and, more specifically, with achievement in arithmetic, reading, and spelling in young children? (*c*) What is the relation between personality traits and general and specific measures of mental ability? (*d*) How are patterns of mental ability related to patterns of academic achievement?

Because of the complexity of these questions and because of the absence of a body of accumulated knowledge on the relationships we have sought to investigate, this research should be thought of essentially as "hypothesis generating" rather than "hypothesis testing" in a strict sense. Although in this initial study we obtained a substantial number of "statistically significant" findings, their true significance will be determined by future research in this complex but highly important area.

Experimental Procedure

Subjects and Research Setting

Our *S*s were 76 third-grade pupils of the Laboratory School at the University of Chicago. They included all the pupils enrolled in the three sections of that grade during the school year 1950-1951, when the longitudinal study was started. These *S*s are substantially above average in general intellectual ability and academic achievement. On both measures, the median child in our sample tends to fall above the 90th percentile on national norms for children of the same age in public schools.

In socioeconomic background the children in this group also represent a relatively small segment of the total population. Almost all of them came from upper middle-class homes with a strong intellectual orientation, many being children of faculty members at the University of Chicago. The school itself is one of unusually high standards where a select staff is devoted to the education of a highly selected student body. Clearly, this is an atypical sample and, consequently, we assume that our findings will apply most directly to children from similar home backgrounds in a similar setting, and who are of comparable ability and achievement.

Actually, these children were chosen for study largely because they are typical of many of the nation's gifted children. More often than not, efforts to establish the factors related to academic achievement have concentrated on the underachiever. This emphasis is understandable in view of the pressure to solve the pedagogical problem of underachievement with all the losses it entails. Still there is a growing need to learn more about such children as our sample represents in order to better utilize human ability and to develop the intellectual resources of the society.

Our choice of the particular age level was governed by our expectations that the determinants we are interested in can be isolated with greater facility and studied with least interference in younger children, and by the fact that research on the academic achievement of children of this age has been surprisingly limited. Because of the general concern with the lack of achievement, previous work in this area has tended to center on the higher levels of education.

Grade 3 was chosen rather than any of the earlier grades because in the present system it marks the actual beginning of formal education.

By the time children reach this level they are used to school life in general. They are subjected to a higher degree of structure in school activities and a markedly greater academic orientation. The master of the basic linguistic and mathematical skills introduced in the first two grades is taken more seriously here and standardized tests in these academic areas are introduced for the first time in Grade 3.

Types of Data

Various types of data were obtained in order to provide measures of each child's academic achievement, his level of intellectual ability, the nature and extent of external pressures acting upon him, and his developing personality structure.

Academic achievement tests. To evaluate academic achievement, standardized achievement tests in arithmetic, reading, and spelling were administered to all *S*s during the first weeks of the school year (October) and again near the end of the school year (May). By obtaining two samples of achievement data we hoped to determine the stability of the achievement measure in itself, the beginnings of any systematic shifts in achievement patterns, and in their relation to the other factors investigated. The academic achievement tests given in October were: Iowa Every-Pupil Arithmetic D Elementary Form L, Chicago Reading Test B Form I, Stanford Spelling Form E. In May the following tests were used: Iowa Every-Pupil Arithmetic Test C Elementary Form M, Chicago Reading Test C Form I, Stanford Spelling Form E.

The skills tested by the above tests are: understanding of arithmetic concepts, arithmetic problem solving, reading comprehension, and the spelling of words given in context.

Mental ability tests. As part of the regular testing program in the Laboratory School, the children were given individually the revised Stanford-Binet Test, Form L. The Primary Mental Abilities (PMA) test was also administered to them as a group. The factors measured by this elementary battery are:

Verbal meaning (two tests). In the verbal *w* test, the student is required to select synonyms for given words. In the verbal *p* test, a list of words is read to the pupil, and for each word he is required to find the corresponding picture from a group of four possible choices.

Space. In this test, the student is asked to select from a group of four figures the one that would make a sample drawing into a complete square. The figures must be rotated before they will fit.

Reasoning (two tests). The reasoning *w* test requires the *S* to find the rule or principle involved in a series of words. In the reasoning test, figures instead of words are used.

Perception. In this test, the student is asked to find two drawings that are exactly alike from a series of drawings of familiar objects.

Number. This is a test of addition with numbers.

Total. The total score for each *S* is essentially the average of his standard scores on the above tests.

Parental pressures. Our attempts to obtain accurate information on the complex of parental pressures included teacher interviews with parents, questionnaires filled out by parents, interviews with the children, and such background material as was contained in the cumulative records of each child in the records office of the school.[3]

It was not possible, of course, to obtain information on many of the ways in which parents exert pressures on their children since many of these pressures tend to be communicated by subtle ways that elude the tools available to us for their appraisal. We believe that the lack of such crucial information is compensated for, in part, by information obtained in the interview with the child, the observation of his behavior, and the personality tests—since these tools give a picture of how the child perceives the adult world, the pressures that the parents exert on him, and the manner in which he responds to the various socializing forces.

Behavioral observations. Throughout the year, two of the investigators observed the children periodically in many different situations: in the classroom, during the lunch hour, on the playground, and in a variety of the less routine school activities. Our purpose was to obtain a balanced picture of the various areas of proficiency of each child and to get a full picture of how he functions in the school environment.

For the first few weeks the *O*s worked closely together in the same situations and compared observations at the end of each period. When we felt that a satisfactory degree of agreement was arrived at, this procedure was discontinued and observations were made independently. All the children were observed by each *O*, each spending a minimum of 270 hours observing the children during the school year. So much time was spent with the children because our purpose was to get to know each child well as a person; how he behaved in different situations, and what his typical reactions were to the various aspects of his school existence.

The data on parental pressures and the behavioral observations were all kept in a private file for each child. The data in this file formed the basis for judging the child on (*a*) certain personal characteristics such as spontaneity, self-confidence, persistence; (*b*) interpersonal relations with peers and adults; and (*c*) attitudes toward all of his school subjects.

A list of 27 variables covering these areas was drawn up. The variables were rated independently by two of the authors on a five-point scale in accordance with a manual prepared for this purpose.

[3] Copies of the parent questionnaires and the questions that were asked of each child during the interview are included in Appendix A.

When differences in the ratings were found, agreement was arrived at by further discussion. In the few cases where disagreement persisted, the average of the two ratings was used. The following observational variables were rated for each child. The r after each variable indicates the interjudge product-moment reliability coefficient:

1. Dependent on teacher; e.g., depends on teacher for direction and help in work; asks many questions ($r = .95$).
2. Cooperative with teacher ($r = .88$).
3. Warm and affectionate toward teacher ($r = .88$).
4. Effective as group leader ($r = .89$).
5. Effective as group participant ($r = .78$).
6. Popular with peers ($r = .78$).
7. Dependent on peers; e.g., depends on peers for direction and help in work, for affection and approval ($r = .93$).
8. Competitive ($r = .84$).
9. Hostile; e.g., gets in many fights and arguments; expresses criticism and hostile attitudes toward others ($r = .86$).
10. Spontaneous; expresses himself and acts freely ($r = .87$).
11. Active in tempo ($r = .85$).
12. Self-confident; e.g., confident in ability to do schoolwork; volunteers for difficult tasks ($r = .85$).
13. Relaxed ($r = .80$).
14. Bids for attention ($r = .90$).
15. Persistent; e.g., uses time constructively and to good purpose; stays with work until finished ($r = .84$).
16. Neat ($r = .85$).
17. Has warm and affectionate relations with parents ($r = .81$).
18. Has overprotective parents ($r = .81$).
19. Has parents who exert pressure for achievement ($r = .86$).
20. Warm and affectionate toward siblings ($r = .88$).
21. Likes arithmetic ($r = .97$).
22. Likes reading ($r = .89$).
23. Likes spelling ($r = .93$).
24. Likes art ($r = .92$).
25. Likes shops ($r = .98$).
26. Likes music ($r = .78$).
27. Likes gym ($r = .95$).

Personality tests. In the few studies that have sought to investigate the relationship between quasi-stable personality structure and academic learning, there has been a tendency to depend on a single tool for the assessment of personality factors. In the present study we have approached these factors from various vantage points with the hope of arriving at a more valid evaluation of specific personality characteristics instead of broad inferential descriptions.

The Rorschach test and the Children's Apperception Test (CAT) were given to each child to provide information concerning various important aspects of the personality structure and mode of mental functioning that the other data did not tap. These two projective tests were administered individually to all *S*s. Each test protocol was examined. Lists of variables were drawn up for each test, and their precise definition was agreed upon by the two raters.

All the records were examined, and the range of ratings was determined in the manner described. The choice of the particular variables was determined by the various aspects of the personality that we expected to relate meaningfully to academic achievement; such aspects as the child's perception of the world, of his superiors, peers, and siblings; his attitudes toward himself and others; and the areas and degree of impulse, conflict, and mastery. The following variables were rated from the Rorschach test protocols (r's indicate interjudge reliabilities):[4]

1. Abstract vs. concrete approach; e.g., high proportion of *W* and lower *D;* good form quality of *W; Z,* organization of blot.
2. Orginality vs. stereotypy; e.g., high proportion of *M;* low proportion of *A;* lack of excessive *P;* variability of content categories ($r = .88$).
3. Spontaneity vs. rigidity; e.g., high *M:C* ratio; low proportion of *F* responses; high *H* and *A* in proportion to *Hd* and *Ad;* flexible sequence ($r = .91$).
4. Activity vs. passivity; e.g., type of *M;* normal proportion of *Y;* average *S* ($r = .64$).
5. Ego strength; e.g., normal proportion of *F;* lack of color and shading shock; high proportion of *H;* average *S;* high *FC* in proportion of *CF* and *C;* absence of inhibition, compulsive control, and anxiety; average distribution of locations, determinants, and content categories ($r = .78$).
6. Introversive vs. extratensive tendency *M:C* ($r = .91$).
7. Introversive vs. extratensive tendency: *FM* and *m:* Sum *Y* and *T* ($r = .94$).
8. Inhibited vs. uninhibited emotional response; e.g., low *C, M,* and *W* and high *F* ratio; excessive *F;* emphasis on black; high *A;* high *P;* high *FC* in proportion to *CF* and *C;* lack of explosive content ($r = .85$).
9. Anxiety; e.g., high proportion of *Y, V,* and *T;* high *m; x;* card description; card rejection ($r = .71$).
10. Compulsivity; e.g., high proportion of *Dd;* high proportion of *Hd* and *Ad;* large number of responses; rigid sequence; high proportion of *F* and *F* ($r = .79$).
11. Aggression; e.g., fighting and aggressive acts; implements of aggression ($r = .94$).
12. Oral concern; e.g., eating, drinking, mouths, foods ($r = .88$).
13. Genital sex concern; e.g., clothing responses; over or under reactions to sexual symbols ($r = .71$).

[4] The symbols used to refer to scoring categories on the Rorschach are taken from Beck (1944).

The following variables were rated from the CAT protocol (*r*'s indicate interjudge reliabilities):

1. Activity, emotional expressiveness, and spontaneity vs. passivity and emotional inhibition; e.g., expression of strong emotions, wishes, and wants; story movement and action rather than card description; initiative and independent actions of figures identified with; emotional interaction of characters; quotes and expressions of involvement ($r = .86$).
2. Originality vs. stereotypy ($r = .86$).
3. Coherence of plot vs. disorganization ($r = .62$).
4. Complexity vs. simplicity of plot ($r = .88$).
5. Abstract concepts; e.g., generalization from stimulus detail and inclusion of several elements of picture in one concept ($r = .51$).
6. Whole approach; e.g., inclusion of major elements of picture in central story theme ($r = .57$).
7. Ego strength; e.g., recognition and solution of conflict situations; integration of emotions and actions; absence of expressions of anxiety; feelings of security and self-confidence ($r = .78$).
8. Postive vs. negative feeling tone ($r = .76$).
9. Rigidity of defenses vs. disorganization and extreme anxiety ($r = .87$).
10. Compulsivity; e.g., qualifications and indecisiveness in story; enumeration of objects, activities, etc. ($r = .78$).
11. Free-floating anxiety; e.g., expressions of unknown fears and threats ($r = .84$).
12. Helplessness of children in adult world ($r = .66$).
13. Guilt feelings; e.g., punishment themes; concern with right and wrong; concern with opinions of others ($r = .66$).
14. Rejection; e.g., fear of separation from parents ($r = .81$).
15. Aggression ($r = .85$).
16. Oral passive receptive; e.g., concern with receiving food, eating, etc. ($r = .54$).
17. Fear of oral deprivation; e.g., concern with hunger; connection of punishment and food themes ($r = .73$).
18. Anal concern; e.g., washing, cleaning, and punishment for being dirty; messing ($r = .68$).
19. Genital sex concern; e.g., primal scene anxiety; castration fear; masturbation anxiety ($r = .72$).
20. Positive vs. negative reactions to mother figure ($r = .67$).
21. Positive vs. negative reactions to father figure ($r = .79$).
22. Competitiveness with siblings ($r = .78$).

In an initial study of these variables, intercorrelations (product-moment *r*'s) were obtained for all the variables within each list to determine possible functional duplication of variables. Six of the initial intercorrelations among the CAT scores were sufficiently high to justify combining and renaming them. This procedure reduced the original set of 28 variables to the final list given here.

The variables in each list (observational data, Rorschach, and CAT) were further correlated with the variables in the other two lists to determine the degree to which the different techniques might be measuring the same facets of the personality. This set of correlations indicated that there was little duplication and that different aspects of the personality were being revealed by the different types of data.

Analysis of Data

Before giving a step-by-step analysis of how the data were utilized, we shall restate briefly the central aim of the study and outline its basic design. Our primary objective in this phase of the research was to delineate various mental and personality correlates of the level and pattern of academic achievement. We tried to do this by determining (*a*) how mental ability is related to achievement, (*b*) what personality characteristics are associated with achievement, (*c*) to what extent personality-achievement relationships are a function of the level of mental ability, and (*d*) how do personality characteristics and mental ability relate with one another. This three-legged stool could be looked at graphically in some manner as the following:

According to this formulation the data were analyzed as follows:

1. Achievement scores in reading, arithmetic, and spelling (for the tests given in October and in May) were correlated with the personality ratings.
2. Scores on the Stanford-Binet and PMA total scores were partialled out of these correlations to determine the effect of general mental ability.
3. "Discrepancy scores" were computed by transforming the scores for each achievement test to normalized standard scores. These scores were obtained by averaging each child's standard scores and then computing the deviation of each child's standard score on each of the achievement tests from *his* average standard score. Thus, the discrepancy scores present each child's relative achievement in the three academic areas, regardless of his rank in the group. These scores were correlated with the personality ratings.
4. Achievement profiles were determined for all 76 *S*s on the basis of their scores on the October tests. The 76 *S*s were then divided by inspection into six groups according to the patterns of achievement as follows:

HA–LR High Arithmetic—Low Reading ($n = 15$)
LA–HR Low Arithmetic—High Reading ($n = 11$)

HA–LS High Arithmetic—Low Spelling ($n = 11$)
LA–HS Low Arithmetic—High-Spelling ($n = 13$)

HR–LS High Reading—Low Spelling ($n = 15$)
LR–HS Low Reading—High Spelling ($n = 11$)

Children who were assigned to the above subgroups on the basis of their achievement scores were then compared in terms of their ratings on each of the 62 personality and observational variables. Specifically, 2 × 5 contingency tables were constructed by comparing, for example, the HA–LR and the LA–HR groups on each of the personality and observational variables. Because of the relatively small number of children involved, these preliminary tables were reduced to fourfold tables by dividing each rating at its median and computing chi squares with Yates' correction for continuity.

5. Primary Mental Abilities test scores were correlated with personality and observational ratings. In order to remove the influence of general ability on these correlations, Stanford-Binet and PMA total scores were partialled out. "Discrepancy scores" were also computed from the PMA scores in the manner described above. They represent a child's relative standing on various abilities independent of his general ability score.

Relation of Personality and Academic Achievement

Personality Traits Correlated with Achievement

Because little is known of the sets of relationships among socialization pressures, developing personality structure, and the ways in which the child learns to direct and utilize his energies toward valued goals in the world as he sees it and the degree of proficiency in the skills necessary to achieve in different academic areas, our effort has been to study these factors in concert. We have particularly investigated the relations among academic achievement and personality structure, personality structure and mental ability, and mental ability and academic achievement.

Table 1 presents results obtained when the observational and personality variables were correlated with general academic achievement and with achievement in arithmetic, reading, and spelling. Since a large number of correlations were computed, a test was made to determine whether the number of correlations reaching the .05 and .01 levels of significance exceeded the number that would be expected to occur "by chance" alone. The number of "significant" correlations not only greatly exceeded chance expectations (probability level of .001) but the obtained correlations generally make sense psychologically, and it is possible to group them for each set of variables into fairly clear-cut personality descriptions.[5]

The statements to follow pertain to characteristic trends or tendencies, i.e., r's at the .05 level or higher. We present them with caution as tentative findings rather than firm conclusions. Further research with populations of different age groups and more varied socioeconomic backgrounds is required before these findings can be generalized. Together, however, the observed trends seem to add up to a total meaningful picture. The pictures that emerge for the four achievement groups differ, and presumably reflect different developing personality organizations and various approaches to academic subject matters and materials.

These results refer to the relation of personality and achievement in third-grade children only. They do not refer to the degree of stability of the observed tendencies or the amount and kind of change that may come with time.

It will be noted that Table 1 presents correlations of the two sets of achievement measures with personality characteristics. The high degree of consistency in the findings tends to emphasize the stability and the meaningfulness of the relations among personality traits and high general and differential academic achievement. Furthermore, when a difference is noted between the October and May results, it tends to be in the direction of signifying more clearly the relationship indicated by the first set of correlations.

[5] This test assumes that the correlations are independent. However, the observational and personality ratings and the achievement scores are not strictly independent measures so that this test is suggestive rather than strict. In the next section the same test was made for the number of correlations obtained between the observational and personality ratings and various PMA scores. In that case also, this test is suggestive since both sets of measures are intercorrelated to some degree.

High general achievers. Examination of Table 1 shows that children who receive high scores on the arithmetic, reading, and spelling tests may be characterized by traits representing exposure and responsiveness to cultural influences. Their conformity and acceptance of parental values seem to give them a high degree of security and confidence in their relation to their parents as well as to other adults. Their relationship with their teachers is also one of cooperation. These children put much effort into schoolwork and do it neatly and persistently. They are independent, self-confident, and effective participants in group activities. They also tend to be competitive with siblings and peers.

Along with the observable evidence of ego integration and emotional control are signs of inner strain. One has the impression that these children are trying hard to live up to adult expectations. They have well-developed superegos and express strong guilt feelings and concern with problems of discipline and control. Their lack of complete acceptance of, and ambivalence about, parental values appears in the unconscious expression of negative feelings toward the parents, particularly the mother.

In general, however, the general achievers show a high degree of inner harmony and are rather adept at controlling their emotions and at organizing and integrating their experiences, ideas, and feelings. The originality of their fantasy productions, capacity to handle abstract concepts effectively, and the fine balance between extratensive and introversive tendencies are characteristic of children who show a high level of over-all academic achievement.

High arithmetic achievers. Children who show superior performance in arithmetic present a personality picture similar to the general achievers, but they tend to be more spontaneous and free in their behavior. In their interpersonal relations they tend to be more aggressive, independent, and self-confident than are the children in the other subgroups. Of all organized school activities they prefer gym where they can express themselves actively and aggressively. But, in spite of their aggressive and self-assertive tendencies, they work well with others, are effective in group activities, and tend to occupy positions of leadership in the group. However, they maintain a high degree of independence in their relations with peers.

In their relations to the adult world (as well as to the peer culture) they show themselves secure and confident. In viewing their parents as authority figures and in their relations with them generally they show less strain than the high general achievers and the high achievers in reading, and greater independence than the high spelling achievers. The family picture is similar to that of the general high achievers and the achievers in reading in that the parents tend to be pressing in their demands for achievement and overprotective. Still the relation of these children to their parents tends to be more positive than that of either of the two other groups.

In their intellectual activity, the arithmetic achievers exhibit a capacity to handle details skillfully and to grasp new and meaningful relations between parts of the stimulus situation. Their mental approach is not so abstract as that of the readers, but they organize and manipulate problem materials more effectively. Evidence of the association of comfort, competence, and flexibility of organization with respect to non-interpersonal material, which Rochlin (1952) found among mathematics achievers at the college level, is observed in this group.

High reading achievers. The reading achievers turn inward and use their imagination to work out their conflicts. They are unable to express their feelings openly and are tense and strained in their behavior. They communicate little and are lacking in warmth in their relations with both adults and peers. In the peer group they are the least popular.

These children show the most intense free-floating anxiety of any group as well as the greatest fear of parental rejection and deprivation. They also are least confident in themselves. Although by no means as competitive as the arithmetic achievers, they show a high degree of competitiveness and

TABLE 1

CORRELATIONS OF PERSONALITY VARIABLES AND ACHIEVEMENT TEST SCORES FOR OCTOBER AND MAY TESTINGS

Personality Variables	General Achievement			Arithmetic			Reading			Spelling		
	Oct.[a]		May	Oct.[a]		May	Oct.[a]		May	Oct.[a]		May
A. Observations												
1. Dependent on teacher	−.23*	(−.22)	−.11				−.17		−.19	−.24*	(−.22)	−.07
2. Cooperative with teacher		(.23)*								.24*	(.27)*	.30**
5. Effective as group participant	.20	(.21)	.24*	.19		.10	.15		(.21)	.19		.14
6. Popular with peers										.18		.10
7. Dependent on peers	−.23*		−.19	−.27*	(−.22)	−.27*				−.20		−.20
8. Competitive	.26*	(.23)*	.18	.42**	(.38)**	.26*	.22	(.19)	.14			
9. Hostile				.22	(.19)	.13						
10. Spontaneous				.20		.10				−.10		−.23*
11. Active				.27*	(.24)*	.13						
12. Self-confident	.19	(.20)	.07	.26*	(.27)*	.14				.21		.08
13. Relaxed	−.19		−.24*				−.23*	(−.19)	−.23*			
14. Bids for attention										−.16	(−.19)	−.19
15. Persistent	.35**	(.38)**	.29*	.28*	(.28)*	.31**	.23*	(.23)*	.21	.39**	(.39)**	.42**
16. Neat	.19	(.33)**	.09							.30**	(.34)**	.36**
17. Warm and affectionate parents	−.12		−.18									
18. Overprotective parents	.18	(.18)	.20	.29*	(.27)*	.22	.11		.18			
19. Parents exert strong pressure for achievement	.12		.21									
20. Warm toward siblings	−.44**	(−.50)**	−.26*	−.41**	(−.43)**	−.26*	−.41**	(−.43)**	−.25	−.34**	(−.34)**	−.34**
21. Likes arithmetic				.21		.29*						
22. Likes reading	.11	(.36)**	.29*				.14		.41			
23. Likes spelling	.25*		.14							.42**	(.45)**	.38**
26. Likes music		(.21)						(.20)				
27. Likes gym				.17		.19						

TABLE 1—Continued

Personality Variables	General Achievement		Arithmetic		Reading		Spelling	
	Oct.[a]	May	Oct.[a]	May	Oct.[a]	May	Oct.[a]	May
B. Children's Apperceptive Test								
2. Originality			.09	.18				
4. Complexity of plot			.13	.20				
5. Abstract concepts	.24* (.21)	.34**	.26* (.22)	.29*	.25* (.21)	.33**		
7. Ego strength			.20	.20				
9. Rigidity of defenses	.18 (.20)	.08	.18 (.19)	.04	.19 (.19)	.06		
10. Compulsivity	(.24)*		(.23)*		.21 (.24)*	.15		
12. Helplessness in adult world	−.20	−.15			−.22	−.20		
13. Guilt feelings	.34** (.20)	.34**	.32** (.26)*	.36**	.31** (.24)*	.31**	.26* (.22)	.19
14. Rejection	−.23* (−.27)*	−.10			.19 (.25)*	.28*	−.20 (−.22)	−.27*
16. Passive oral receptive	.25* (.21)	.16	.23* (.19)	.20	.24* (.20)	.19	.32** (.25)*	.35**
18. Anal Concern	.21 (−.19)	.12	.37** (.33)**	.09	.16	.18		
19. Genital sex concern	.20	.34**	.15	.26*	.20 (.19)	.34**		
20. Positive reactions to mother	−.21	−.19	−.18 (−.22)	−.12	−.24* (−.24)*	−.24*		
C. Rorschach								
1. Abstract approach					.02	.22		
2. Originality	.19 (−.25)*	.21			.22	−.22	−.20	.08
3. Sponteneity					.19	.20		
6. Introversive M:C	.20	.02			.19	−.01		
7. Introversive FM:Y	.07	.19			−.01	.20	.07	.18
10. Compulsivity			.14	.23*			.13	.29*
11. Aggression			.19	.17				
12. Oral concern							.04	.21
13. Genital sex concern			.02	.18	.19	.22		

Note.—To save space only the variables with a correlation of .18 or higher are included.
[a] October correlations with Stanford-Binet IQ partialled out shown in parentheses.
* Significant at .05 level.
** Significant at .01 level.

ill-feeling toward their siblings. In general, they are less concerned with parental pressures and problems of control and discipline than the arithmetic group, but they exceed the other groups in their concern with sex problems.

The mental approach is strikingly abstract and theoretical, but in dealing with objective quantitative data and in organizing problem material they are markedly inferior to the arithmetic achievers. They tend to be less persistent than the arithmetic and spelling groups and show less patience with the routine school tasks. Their interest centers, rather, in the subjective symbolic subject matter areas. They prefer passive activities, such as music and reading, to all the other school activities, and they particularly dislike shop, where the manipulation and mastery of tools and materials are required.

While the arithmetic achievers may be described, in general, as outwardly oriented, this group is more inwardly bent. Although they are restricted and compulsive in their behavior, they are much more imaginative, spontaneous, original, and expansive in their fantasy life.

High spelling achievers. The spelling group tends to be passive and calm, with few evident anxieties in their behavior or fantasy. Their parents exert the least pressure for achievement, and the children tend to be more secure and passive in relation to them. Signs of ambivalence about accepting parental values are very few. They show less fear of oral deprivation, less guilt feelings, and less negative reactions to the mother and father figures than the arithmetic and reading achievers. Of all the groups, they are the least competitive with their peers and, in general, the least negative and aggressive. However, they, like the readers, express a great deal of hostility toward their siblings. The high spelling achievers relate most positively to adults and peers, but they tend to play a passive role in their social relations. In their behavior they are unobtrusive and calm and do not seek to attract attention to themselves. They are by far the most cooperative with the teacher and the most popular with peers.

Of the groups under consideration, the spelling achievers are the least active and spontaneous, and the most compulsive in their reactions. They do their schoolwork extremely persistently and neatly. They dislike art work, through which they are encouraged to express themselves freely with different media. Their fantasy productions convey the same rigidity, constrictiveness, and emotional inhibition as well as few signs of conflict and anxiety. While at the behavorial level the spelling achievers seem secure and confident, their projective records denote an immature psyche and a lack of ego strength and firmness.

The mental approach of this group is concrete and stereotyped. Whereas the arithmetic achievers show a similar tendency toward an objective, practical approach, they also manifest the power to organize parts into meaningful and complex wholes and the capacity to construct abstract concepts from concrete facts—abilities which the spelling achievers seem to lack.

The Role of Measured Intelligence

No significant change was observed in the above findings when the Stanford-Binet IQ and PMA total scores were partialled out as indicated in Table 1. This suggests that the observed relationships between personality factors and achievement are not primarily a function of measured intelligence. It will be noted, however, that a few personality factors show some relation to measured intelligence. These are: cooperation with the teacher, compulsivity, and stereotypy or lack of originality.

Role of General Achievement

In correlating the personality ratings with the discrepancy scores that represent each child's achievement in arithmetic, reading, and spelling relative to his over-all average level of achievement, we sought a cross-check on the validity of our reported find-

ings.[6] We hoped, in particular, to determine (*a*) whether children who incline toward any one of these three areas—regardless of the level at which they achieve—also show similar personality traits, and (*b*) if so, how do they compare with the children who achieve at a high level in terms of the group norm. In other words, we wished to answer a general question such as the following: "If Johnny is an average student but does much better in one area (arithmetic, reading, or spelling), does he tend to show the same personality and behavior patterns as Ted, who is at the top of the class in the same subject-matter area?"

Since the findings from these data do not add much to the first set of correlations, we have not included them here. Their significance lies in the fact that they do not differ from (but, rather, lend support to) the results already reported. This set of correlations showed a basic similarity in the personality structure of the children who achieve in any one of the three areas (arithmetic, reading, and spelling), regardless of the level of achievement. This pattern was similar to, but not identical with, the personality picture of the children who achieved highly in the same area in terms of the group norm. The difference centered in those items that we have found to be closely associated with high achievement, such as interest in school activities, good work habits, competitive and aggressive behavior, passivity in relation to firmly directive parents, conflict over the internalization of parental values, a rigid superego, and mental activity that is marked by originality and competency in conceptual thinking.

Patterns of Achievement

For further verification of the assumption that an individual's personality structure is related to the manner and extent to which he will utilize his energies in pursuing different academic subjects, we compared the personality ratings of six groups of children who showed contrasting achievement patterns.[7] The findings obtained by this method were consistent with our other findings regarding differential achievement and tended to emphasize the differentiating characteristics of these groups.

Comparison was made between children who achieved highly in arithmetic but were low in reading (HA–LR), and those who were high achievers in reading but low in arithmetic (HR–LA). The children in the HA–LR group were found to be more responsive and spontaneous in their interpersonal relations and free in their emotional expression. They enjoyed more positive relations within as well as outside their family group, and in mastering objective experiences they showed greater skill and flexibility.

The high-arithmetic and low-spelling group (HA–LS) as compared with the low-arithmetic and high-spelling group (LA–HS) is characterized by greater spontaneity and independence. Children in the former group tend to be less passive in all their relations and particularly in their relations with their parents. They are also more academically inclined and more effective in dealing with mental tasks.

The comparison of the high-reading and low-spelling group (HR–LS) and the low-reading and high-spelling group (LR–HS) emphasizes the independence of the former, their rich fantasy life and their facility in handling verbal and symbolic stimuli.

Discussion of Achievement Results

In comparing the results of the present study with the findings from other investigations, we find the following relationships. In regard to high general achievement, Cattell (1945), Steinzor (1944), and Thompson (1948) have pointed to the high achievers' greater awareness of, responsiveness to, and conformity with environmental influences. Several other cross-sectional studies, most of which base their judgments of personality on the results of one or two objective tests, have indicated a relationship between achievement and introversive tend-

[6] The correlations of October and May discrepancy scores and personality variables are presented in Appendix B.

[7] See Appendix C.

encies. High achievers have also been characterized by self-sufficiency, conscientiousness, persistence, a wide range of interests (particularly in the academic fields), a good adjustment in the school situation, and an urge to achieve. Other characteristics of high achievers that have been indicated are emotional tension, a high level of anxiety, good emotional and intellectual control, facility in expressing aggressive and hostile feelings, and positive relations with parents.

With respect to the area of high achievers' social relations, the results of previous studies are equivocal. Gough (1949), Eckert (1935), and Neel and Matthews (1935) report a tendency on the part of achievers to be withdrawn in their social relations, whereas Steinzor (1944) and Kurtz and Swenson (1951) conclude that the achievers are better able than the underachievers to enter into personal relations and that they tend to enjoy more plentiful and supportive peer contacts. Young, Drought, and Bergstresser (1937), on the other hand, found no relation between affiliativeness and achievement.

The personality picture of the 8–9-year-old achievers obtained in the present study is, on the whole, in harmony with the trends reported here, which suggest a picture of children who have responded to cultural pressures and have made strides in internalizing adult values. The achiever's acceptance of these values is reflected in his academic interests, for example, his conscious effort to achieve in school and such related traits as compliance with authority, perseverance, and emotional control. It would seem that the achiever's acceptance of such upper middle-class values has been accomplished at the cost of a certain degree of anxiety, strain, and loss of freedom in emotional expression. However, the channeling of aggressive impulses into culturally approved behaviors and skills, and the feelings of security in relation to the adult world, which are accompanied by inner flexibility and ego integration, are signs that the high achievers have succeeded in establishing outlets that help them to cope successfully with the stresses and strains of the socialization process.

In view of the inconsistency of previous findings regarding the social interaction of the high achiever, we wish to emphasize our results in this respect. We find that, whereas the high achiever does not show warmth and emotional spontaneity in his reaction to other people, he has attained a degree of ego identity and integration which makes it possible for him to enter into effective relationships with others on a more objective footing and to be an effective group participant. This type of interaction is, in a way, as much an expression of his cultural orientation as his competitiveness. For are not the two modes of behavior, contradictory as they may seem, sanctioned by the cultural code that he apparently feels he must abide by?

With respect to achievement in arithmetic among college students, the results of the present study give support to the findings of Munroe (1946) and Rochlin (1952) concerning the objective approach of the mathematics achievers and their competence and flexibility of organization with regard to noninterpersonal activities. The fluidity of imagination, the directness of ideational reactions, the adaptability and emotional directness referred to by Cattell (1945) are also reflected in the personality picture that was found to be associated with achievement in arithmetic. Our findings indicate, further, a relatively positive relationship with the parents, independence and autonomy in behavior, effective controls, and generally good ego functions for this age level.

In comparison with third-grade spelling and reading, arithmetic requires, beyond the manipulation of objective, detailed material and the availability of past learning, a capacity to see relationships between parts of the stimulus material and to reorganize the parts into new conceptual wholes. It is hypothesized that the facility with which the arithmetic achievers express their hostile feelings in behavior makes it unnecessary for them to work out their conflicts subjectively to the degree that the reading achievers seem to do. Hence, the arithmetic achievers can work with objective factual data more freely. The security and inde-

pendence that these children experience in their relations to their parents may also mean greater freedom to attempt problem solving on their own. This is quite plausible in the light of studies of the effect of institutional living on the mental development of the child. These studies have shown that children brought up in institutions that do not provide for warm and positive relating with parental figures often suffer from lack of intellectual freedom and enterprise and are lacking in their capacity to manipulate and reorganize stimulus material outside the specific context in which it is given (Goldfarb, 1943; Spitz: 1949a, 1949b).

Studies with adults have shown that *S*s with linguistic and verbal ability tend to be antisocial, inwardly bent, imaginative, and introspective. Sanford, Adkins, Miller, Cobb, et al. (1943), who also worked with children, report that those who did well in the subjects requiring verbal ability showed (besides the characteristics of the general achievers) a lack of constriction in the use of emotional material in fantasy and a predominance of antisocial fantasies. Working also with children, Levy (1933) found achievement in reading to be related to maternal overprotection, whereas Vorhaus (1946) and Stewart (1950) associate parental overprotection with retardation in this field.

In relating these findings to the results of the present study, it becomes apparent that further clarification of the relation of parental overprotection and reading achievement is needed. It will be remembered that in the present study no appreciable difference was found in the overprotectiveness of the parents of the reading and arithmetic achievers and that the slight difference that was observed weighted in the opposite direction from the one Levy indicates. The major difference we found in the child's reaction to parental control and the channels of emotional expressiveness that are available to him. We were led to believe that overprotectiveness in itself is not the main differentiating element between the arithmetic and reading achievers but, rather, the quality of the parent-child relationship and its emotional overtones. From our findings it appears that the overcontrolled child, who is shy and submissive and who responds negatively to parental control but is unable to express his feelings overtly, turns to a symbolic subjective mode of expressing his conflicts.

Reading at the third-grade level is a task that requires the substitution of one symbol for another and hence it calls primarily for response in terms of past learning. Thus, it is hypothesized that the good readers who, like the arithmetic high achievers, put great effort into their school work acquire a source of experience which explains their success in such tasks. The reading achievers, due to their constrictiveness and incapacity for overt emotional reactivity, lack the competence that the arithmetic achievers have in working with objective, factual, and quantitative stimulus materials and the active approach to intellectual data that is required in successful problem solving.

The hypothesis regarding the relation of warm emotional relating, inner integration and flexibility, and the capacity to reorganize and manipulate objective stimulus material is borne out by the findings regarding the relation of personality to reading achievement. Third-grade reading does not require the perception of relationships and the reorganization of given material that is required in problem solving in arithmetic. It does seem that, because the reading achievers lack the freedom and the inner integration of the arithmetic achievers, they are incapable of intellectual activity that requires the objective reconstruction of reality.

Language is a system of symbols into which experience is translated and articulated. This articulation of experience becomes a means of facilitating the organization, reconstruction, and re-enaction of experience and so makes it possible for the individual to master situations which, in their original form, were beyond his capacity to handle. On the basis of the personality pattern that was found to be associated with reading achievement it appears that the reading achievers turn to the verbal and symbolic areas in attempting to

work out personality problems that they cannot handle more directly.

With regard to spelling achievement, it was hypothesized that because the spelling achievers are not subject to the conflicts and anxieties of the reading achievers and because they try hard to do well in their schoolwork, they achieve a high level of performance in a routine activity that requires dealing with detailed objective stimulus material and the availability of past learning. It is possible that, because the spelling achievers are passive and seemingly secure with their parents and because they are subject to few conflicts and anxieties, they, unlike the reading achievers, do not escape into the world of symbols. On the other hand, the spelling achievers lack the emotional maturity as well as the autonomy and the initiative that are associated with the active problem-solving approach of the arithmetic achievers.

Considering the difficulties involved generally in exploring the patterns of parental controls and their influence on the child's ego development, and especially the limitations of our research in this respect, we project with caution the following considerations regarding the spelling achievers. The children in this group show in their fantasy productions less concern with and anxiety about anal and sexual themes. In their relations to the parents they are considerably more passive than the children in any of the other subgroups. It would seem that their passivity and unconditional surrender to parental controls to a large measure do away with the need for preoccupation with anal and discipline themes. The passivity and lack of sexual curiosity of these children may further explain their general lack of interest in the active acquisition of knowledge. Clinical research has shown that in many individual cases extreme difficulties in learning have been traced back to the stifling of curiosity about sex. In such cases infantalism or abnormal dependency needs are often found to be parts of the general picture. Hence, it seems possible to assume that the attainment of skill in spelling is possible for the children in this group precisely because it does not require intellectual curiosity or an active approach, but rather a passive attitude and the obedient carrying out of rules learned by rote.

Summary

In brief, the results of this part of the study show that groups of children who are similar in their level and pattern of academic achievement also tend to be similar in a variety of personality traits and behavioral characteristics. Although not very pronounced, these trends form a meaningful picture which suggests that, as early as the third grade, academic achievement is related to how the child perceives his world and how he relates to it, and that this relation is somewhat independent of mental ability. Although the personality structure may not fit any particular child in all of its details, it represents the traits that tend to be found in the group of children in the different achievement groups. In general, these traits are as follows:

1. The high general achievers are sensitive and responsive to socialization pressures. They have accepted adult values and strive to live up to adult expectations. Their internalization of these values seems to give them a high degree of security and confidence in their relations with adults, even though they express some underlying hostility toward authority figures. In general, however, they show a high degree of inner harmony and are rather adept at emotional control and at organizing and integrating experience. In the school situation they show a higher level of adjustment than the low achievers; they have developed good work habits and are persistent in them; they have learned to express their hostility in culturally acceptable channels and thus are able to get along well with both adults and peers.

2. The high arithmetic achievers tend to be more at peace with the world and with themselves. In their relations with their parents and other authority figures they show less strain than the high general achievers and the high reading achievers and greater independence than the high

spelling achievers. They show the greatest degree of ego integration as well as greater maturity in dealing with the outside world of people and things. They are able to express their feelings freely but at the same time they are emotionally controlled and flexible. Their intellectual processes also tend to be spontaneous and creative, and they are the most skilled in the manipulation of abstract symbols.

3. The high reading achievers seem to have withdrawn into themselves and to view the world of reality from a distance. They tend to react negatively to parental authority and are insecure in their relation with the adult world. While they find it difficult to express their feelings openly and to maintain effective relations with others, they show a great deal of freedom and expansiveness in their fantasy. Being relatively independent and free of excessive concern with adult and peer expectations, the good readers are capable of maintaining their sense of integrity by drawing on their own inner resources; with inner freedom and creativity they seek the resolution of their emotional difficulties in symbolic activity.

4. The high spelling achievers are markedly passive and dependent on adult authority. In their relations with their parents, they tend to seek approval by complete submission and strict adherence to the rules. In the school situation, they seem to be equally dependent on outside sources for direction of their thoughts and actions. They are generally less mature than the children in the other groups, both emotionally and intellectually. Their fantasy productions tend to be relatively barren, revealing a lack of inner emotional resources and intellectual creativity. The modality of their mental functioning is further characterized by inflexibility and a concrete and mechanical approach.

Considering the nature of the tasks that are mastered by the different achievement groups, these results may be viewed in the following terms:

1. An adult-like orientation and a degree of adaptive anxiety—if it is not strong enough to endanger the integrity of the ego and the individual's inner freedom—are basic factors in the academic achievement of children.

2. An active approach to intellectual tasks and the capacity to handle objective quantitative data and to reconstruct and reorganize stimulus material are associated with comfortable emotional relations with parents, freedom from free-floating anxiety, and ego integration and flexibility.

3. Inner conflict and an incapacity for emotional expressiveness tend to impede the child's freedom to deal with objective reality and his ability to reorganize stimulus material independently.

4. The passive acceptance of the forces of socialization and the lack of mature ego functions are conditions that tend to accompany good performance on routine intellectual tasks that call for a response in terms of the automatic application of past learning, but seem to interfere with a creative approach to an integration of academic materials.

Relation of Intellectual Abilities and Personality

Personality Traits Correlated with Primary Mental Abilities

In this section we take up the relation between intellectual abilities and personality. The personality variables investigated, as well as the PMA tests used in the present study to measure intellectual abilities, are described later. The PMA tests were chosen because they measure the so-called functional unities of ability in contrast to the combination of knowledges and skills required by achievement tests.

The significant correlations between PMA scores and personality ratings are presented in Table 2. These correlations are generally smaller and fewer in number than those cited earlier between achievement scores and personality ratings. This smaller number of correlations raises the question whether this number of significant relationships might be expected merely by chance. When this possibility was tested, it was found that the number of correlations reaching the .05 and .10 levels of sig-

nificance exceeded the expected number at the probability level of .001.[8] This was not true for the Rorschach variable correlations, however. Since the number of correlations between the Rorschach ratings and the PMA scores was only that expected by chance, these correlations will not be considered in our discussion.

The findings regarding the relationship between personality traits and primary mental abilities are summarized in Table 2. The results from the *verbal w* and *reasoning w* tests are so similar that they are presented together. For our sample, the correlation between these two tests was .61. Evidently when verbal and reasoning abilities are measured by word tests, at least at this age, the influence of reading ability tends to obscure any differences that may be present between these two abilities.

[8] See Footnote 5.

Following is a brief description of personality traits that differentiate the various ability groups:

PMA total. Children who score high on all primary mental abilities are outwardly independent, self-confident, and aggressive. The home picture is one of parental overprotectiveness and pressure for achievement. These children have internalized adult values and feel secure in the adult world. They are also dependent on their parents. Their fantasy stories are characterized by complex story plots and the use of abstract concepts.

Verbal w, reasoning w. These children are tense and strained in their behavior and competitive in the classroom. They express negative feelings toward their parents and siblings in their fantasies, but the negative reactions do not carry over into aggressive or hostile classroom behavior.

TABLE 2

CORRELATIONS OF PRIMARY MENTAL ABILITY TEST SCORES WITH PERSONALITY VARIABLES[a]

Personality Variables	*Vw*	*Vφ*	*S*	*Rw*
A. Observations				
4. Group leader				(−.19)
7. Dependent on peers				−.18
8. Competitive	.23*			.22
13. Relaxed	−.34** (−.31)**			−.20
14. Bids for attention		.19		
16. Neat		−.20		
18. Overprotective parents	.19			.24* (.21)
19. Parents exert pressure for achievement				.21 (.21)
20. Warm toward siblings	−.25* (−.26)*			−.29** (−.30)**
21. Likes arithmetic			−.18	
22. Likes reading	.19	.37** (.27)*		
23. Likes spelling	.18 (.25)*	−.18		
24. Likes art			.24* (.26)*	
25. Likes shop	−.26* (−.25)*			
26. Likes music		(.20)		
27. Likes gym	.20	(−.25)		
B. Children's Apperceptive Test				
1. Activity, spontaneity, and emotional expressiveness			.27* (.27)*	
2. Originality			.26* (.26)*	
3. Coherence of plot	(−.20)			
4. Complexity of plot			.25* (.25)*	
5. Abstract concepts		.33** (.30)**		
6. Whole approach		.23* (.24)*		
7. Ego strength			.20 (.20)	
8. Positive feeling tone	(−.20)			
10. Compulsivity			−.21 (−.21)	
12. Helplessness in adult world	−.21	−.23* (−.19)		−.22
13. Guilt feelings	.26*		.32** (.32)**	.34** (.32)**
14. Rejection	(−.20)		.25* (.25)*	
16. Passive oral receptive		.25* (.21)		
18. Anal concern	.18			.19
20. Positive reactions to mother	−.23* (−.21)	(.23)*		
22. Competitiveness with siblings	−.20 (−.22)			−.20 (−.22)

TABLE 2—Continued

Personality Variables	*Rf*	*P*	*N*	Total Non-*V*	Total
A. Observations					
5. Effective as group participant	.24* (.24)*				
7. Dependent on peers	−.31** (−.25)*			−.25*	−.21
8. Competitive		.23* (.20)	.27* (.27)*		.18
9. Hostile		.28* (.26)*	.26* (.26)*	.21	.25*
10. Spontaneous		.30** (.29)**		.20	
11. Active		.21 (.19)			
12. Self-confident		.29** (.29)**	.25* (.25)*	.22	.19
14. Bids for attention		.25* (.23)*		.19	.20
18. Overprotective parents		.20	.28* (.28)*	.21	.28*
19. Parents exert pressure for achievement			.21 (.21)		.19
20. Warm toward siblings			−.19 (−.19)		−.23*
24. Likes art	.21			.22	.19
26. Likes music		.27* (.29)**	.19	.24*	.21
B. Children's Apperceptive Test					
1. Activity, spontaneity, and emotional expressiveness	.18			.21	
2. Originality	.20			.18	
4. Complexity of plot				.25*	.21
5. Abstract concepts	.23* (.21)			.20	.21
6. Whole approach		−.19 (−.20)	−.19 (−.19)		
7. Ego strength	.21	.18		.20	
10. Compulsivity	−.25* (−.25)*				
12. Helplessness in adult world	−.24* (−.22)	−.20		−.30**	−.24*
13. Guilt feelings	.21	.23* (.19)		.35**	.38**
16. Passive oral receptive		.21	.23* (.22)	.23*	.24*
17. Fear of oral deprivation		−.19 (−.23)*	−.32** (−.33)**		
18. Anal concern				.18	.20
20. Positive reactions to mother	.26* (.28)*				

Note.—Only the variables with a correlation of .18 or higher are included.
* See section on Types of Data for identification of symbols. Entries in parentheses represent October correlations with Stanford-Binet IQ partialled out.
* Significant at .05 level.
** Significant at .01 level.

Number, perception. These two groups show similar personality pictures. The children who score high on the number and perception tests are competitive but, unlike the high verbal group, they are outgoing, self-confident, and aggressive in their behavior. Children who score high on the perception test are further characterized in their behavior by an active tempo, spontaneity, and emotional expressiveness.

In contrast to the other groups, the number and perception groups tend to be passive and dependent and to feel secure with their overprotecting parents. In their fantasy stories both groups tend to concentrate on small details and to omit major elements of the stimulus material.

Space. In their fantasies the children in the high space group are original, emotionally expressive, and flexible; their stories are expansive and complex. Their spontaneity and emotional expressiveness seem to be inwardly directed, however, and do not appear in their classroom behavior. Unlike the other ability groups, these children tend to feel insecure and rejected in their relations with their parents.

Reasoning f. These children, like those in the high space group, are original in their fantasies, but their stories show better organization and more generalization from stimulus detail. They are self-sufficient, independent, and effective as group participants but not so outgoing and emotionally expressive as the children in the number and perception groups.

Children who score high on the reasoning *f* test show warm positive reactions toward their mothers in their fantasies. Briefly, we seem to have the picture of a child who is flexible yet controlled, both in his imaginative productions and in his personal relationships.

Verbal p. These children show immature reactions in class with a good deal of attention-getting behavior. In their fantasy stories they show a capacity to organize and integrate the stimulus material effectively.

Removing the Effects of General Ability

In order to remove the influence of general mental ability on the above relationships, partial correlations and discrepancy scores were computed. Generally, correlations obtained by these procedures seem to emphasize the previous description for each group of children. However, the following traits tended to lose their correlations with separate primary mental abilities: highly developed superego (internalization of adult values), security in adult world, and to a lesser degree, dependence on parents and overprotectiveness by parents. Apparently these traits are related to general intellectual performance rather than to specific abilities. This conclusion is further confirmed by the fact that these traits in particular showed fairly strong correlations with the total PMA score.

Discussion of PMA Results

Recently there has been an increasing interest in the relation of personality characteristics to intellectual abilities (Levy, 1933; Mayman, Schafer, & Rapaport, 1951; Munroe, 1946; Sanford et al., 1943; Stewart, 1950). It seems plausible to suppose that basic temperament characteristics may play a part in the individual's performance on intellectual tasks as well as in his nonintellectual behavior. As an example, quick reactivity to new stimuli and the ability to change set rapidly may be a basic personal trait that is shown in impulsive, spontaneous social behavior. This trait may also permit an individual to perform better on intellectual tests that call for quick perceptual reactions and rapid changes of set, whereas he does poorly on tests that require deliberate analysis before responding.

Emotional factors or personality characteristics may affect intellectual achievement in another way. Certain capacities may be developed or others neglected because of emotional conflicts within the individual. For example, a person may turn to reading as a means of relieving feelings or to escape tensions that he is unable to express or deal with directly. As a result he may perform better on verbal comprehension tests than he does on other tests.

Considering the results reported from similar viewpoints, we can suggest the following tentative explanations of the correlations between personality traits and mental abilities:

Verbal. In our sample, children with a large vocabulary tend to have negative feelings that they cannot express openly. Their behavior tends to be tense, strained, and constricted. It might be suggested that the child who is not at ease in social situations tends to withdraw from other people and to spend more of his time reading and thus performs well on a list of word meanings. Or reading may be a means by which he can release feelings that he is unable to express in behavior, and, correspondingly, his difficulty in expressing his emotions freely and may be reflected only in his tense, strained behavior. With his tension and constriction he may do better on a test that allows him to rely on previous learning and does not require new organization of the test material.

Number. This child is outwardly confident and expressive but underneath he tends to be dependent on his parents and lacking in originality. It may be that, in contrast to the highly verbal child, this child does not need to work out his conflicts in the intellectual sphere to such an extent. Therefore, he may work better with more objective, concrete data. The number test requires routine calculations and this child's relatively better performance on such a task may be related to his other manifestations of passivity and lack of imagination.

Perception. The high perception child is active, spontaneous, and impulsive in his behavior. Perhaps quick reactivity is a general trait in this child and is associated with an ability to respond quickly and accurately to stimulus detail on the perception test. Like the children in the high number group, this child expresses his emotions easily yet is dependent on his parents. These traits may be related to his facility in dealing with objective material that is familiar to him.

Reasoning f. This child is original and spontaneous in his imaginative productions.

He is also independent yet affectionate in interpersonal relations. Perhaps this child is inwardly flexible enough to do well on a task that requires operations that are new to him. In addition, he may be sufficiently independent and self-sufficient to do active problem solving and thus performs well on a test that requires reorganization of parts into new conceptual wholes.

Space. The high space child is original, spontaneous, and expansive in his imaginative productions. Again, these characteristics may be associated with the ability to perform well on the new and different task presented by the space test.

In relating the findings from this part of our study to previous research we find general consistency. A study by Pemberton (1951) related performance by adults on various perceptual and ability factors to temperament variables obtained from self-rating questionnaires. Two of the perceptual tests in her battery—space and perceptual speed—were similar to tests included in the present study. Pemberton found that *S*s who were high on perceptual speed could be characterized as impulsive, generous, unsystematic, and self-centered. These findings are somewhat similar to those obtained in this study; the perception children here were active, spontaneous, and expressive. In telling their stories the perception group were unsystematic in that they tended to omit major elements of the stimulus picture. Pemberton points out that quick reactivity seems to be a general characteristic of the *S*s who do well on space and perception tasks. This is shown by impulsive behavior and quick perceptual reactions. We might mention at this point that Gehlmann (1951), after correlating objective test scores and results from personality questionnaires, reported that *S*s who were high on perceptual factors were sociable and carefree.

The *S*s in Pemberton's space group were characterized as socially retiring, self-confident, optimistic, impulsive, and flexible. The children in the space group of the present study were found to be inwardly flexible and imaginative and not competitive in their behavior.

Other studies in this field have dealt mainly with the differentiation of verbal and mathematical abilities and their associated personality characteristics. The findings of Munroe (1946) and Cattell (1945) indicate that the person with relatively higher verbal ability tends to be imaginative, insecure, shy, and introverted, whereas the person with relatively higher quantitative abilities tends to be more objective, outgoing, and sociable. In addition, Sanford et al. (1943) report antisocial fantasies for their high verbal group. Results with the PMA verbal test support to some extent this general picture of the verbal person; the findings indicate that the high verbal child is tense and strained in his interpersonal relations and has antisocial fantasies. In the present study of third-grade children, however, the high verbal child was constricted rather than imaginative in his fantasy productions. This may be a function of such factors as the characteristics of our sample or the children's level of development.

Quantitative ability and number ability cannot be strictly equated, since the latter implies only the ability to deal with routine arithmetic calculations. It would probably be better to include reasoning ability as well, since this is partially measured by the usual mathematics test. In this study we find that the reasoning and number groups are expressive, outgoing, independent, and self-confident in their behavior. Thus, results from the present study agree with the findings of Munroe and Cattell and with our findings regarding the children who do well on arithmetic problem-solving tests.

Sanford et al. (1943), in the research mentioned above, found a relationship between achievement in art and spatial ability. It is interesting to note in this connection that the high space group of this study indicated that they like art better than did any other group of children.

In general, despite the low correlations between primary mental abilities and personality traits obtained in this study, the relationships observed generally support the results of previous research in this field.

Those writers who have listed correlations (Cattell, 1945; Pemberton, 1951) also report low correlations between personality and intellectual characteristics. It may be that personality factors play a small but consistent part in differential abilities of this type.

Summary

In summarizing our findings regarding the relationships between mental ability and personality measures, the following general statements seem to be justified:

1. Children who are inwardly imaginative and spontaneous perform better on mental tests that consist of new material and methods, tests that cannot be solved by previous learning.

2. Children who are dependent and passive, or tense and strained, perform well on tests that consist of familiar material. These children also have parents who are overprotective or exert excessive pressures on them for academic achievement.

3. Children who do not express their feelings freely do better on verbal tasks; children who are more free and active in their behavior and fantasy perform better on tests requiring the manipulation of objective data.

4. If we look at the behavior ratings only, we might form a tentative continuum ranging from rigidity and constriction to labile expressiveness. At the first extreme we would place the verbal group who are tense and constrained in their behavior. Further along this continuum would fall the reasoning group, independent and effective in classroom interaction. Finally we reach the perception group where the children are more expressive, self-confident, and spontaneous. The reasoning group falls at the midpoint, neither as tense and constricted as the verbal group, nor as active and spontaneous as the perception group.

Relation of Mental Ability and Academic Achievement

Having investigated the relations among academic achievement and personality on the one hand and personality and mental ability on the other, our next step will be to examine relations between mental ability and academic achievement.

It will be remembered that little change was observed when the Stanford-Binet and PMA measures of mental ability were partialled out of the correlations of achievement and personality (Table 1). A slight relation did appear, however, between measures of mental ability and such personality traits as confidence, independence, freedom of emotional expression, and facility in generating and using abstractions. Furthermore, in comparing the personality picture of the high ability *S*s and those who are general high achievers we find that those in the high ability group tend to be more confident, expressive, and independent in their behavior, whereas the high achievers show more tension and guilt feelings.

Considering the nature of the present intelligence tests, and in view of the persistent lack of agreement as to the nature of intelligence, it is possible to speculate about the cause-effect relation in different ways. It could be concluded, for example, that native mental capacity makes for greater confidence, freedom, and concern with right and wrong, or conversely that these personality traits make for better performance on the existing intelligence tests. It might be suggested that the children in the high ability group have not learned parental values so thoroughly as the achieving group. It may be that because they are relatively less concerned about achievement or because they do not have to work so hard to achieve academically they are less competitive, tense, conforming to adult standards and also less negative in their reactions to parents. However, the one conclusion that can be made with confidence on the basis of these findings is that the individual's personality structure, his mental ability, and his academic functioning are so interdependent that none of them can be meaningfully considered in isolation.

Table 3, which presents the correlations of two measures of mental ability with measures of achievement in reading, arith-

TABLE 3

CORRELATION OF MENTAL ABILITY AND ACHIEVEMENT SCORES FOR OCTOBER AND MAY TESTINGS

Mental Ability	Arithmetic		Reading		Spelling	
	Oct.	May	Oct.	May	Oct.	May
Vw	.50	.43	.76	.76	.74	.65
Vp	.11	.21	.26	.42	.09	.00
V	.54	.45	.86	.78	.72	.44
S	.17	.17	−.06	−.16	.01	.07
Rw	.54	.48	.63	.61	.46	.43
Rf	.28	.40	.06	.13	.14	.17
R	.50	.52	.50	.47	.40	.40
P	.40	.24	.22	.18	.26	.09
N	.51	.42	.26	.28	.48	.43
Total NV	.50	.51	.26	.35	.34	.31
Total (PMA)	.61	.57	.47	.51	.51	.46
Binet	.34	.28	.37	.49	.20	−.06

metic, and spelling, highlights this interdependence. Here we find the various positive correlations that other observers have pointed to. These correlations are to be expected in view of the fact that intelligence tests use the same kinds of problems that are found in the standard achievement tests and have been often standardized and validated in terms of school achievement. The present correlations do not by any means rule out the influence of personality factors on either academic achievement or performance on the intelligence tests. Furthermore, if personality factors were ruled out from these correlations, and if one were to account for achievement solely in terms of the children's obtained intelligence quotient, one would expect superior performance by the children in this study in all achievement tests, as well as greater uniformity in their patterns of achievement.

A few related findings may be noted in this context regarding specific aspects of this set of correlations. It will be observed, for example, that in general the correlations of all measures of achievement with the total score on the PMA test are higher than the correlations of the same achievement scores with the Binet IQ. This is to be expected when we consider how similar the PMA tests are to standardized tests of achievement in their format, the type of questions they include, and the more extensive the use they make of acquired reading and arithmetical skills.

The difference between the two intelligence tests in their relation to proficiency in spelling is of particular interest (Binet .20 and −.06 for October and May spelling, respectively, and PMA total .51 and .46). This difference may be accounted for by the fact that the test-taking techniques, at which the good spellers at this level are expected to be more proficient, are more useful in the more "school-like" of the two intelligence tests. Achievement in reading, on the other hand, shows the greatest degree of similarity and the least amount of change with time (for October and May tests, Stanford-Binet $r = .37$ and .49, and PMS $r = .47$ and .51). It would seem that, whereas the difference in the value of test-taking technique for the Stanford-Binet and PMA tests is quite marked, the effects of proficiency in reading on the two tests is by no means so great.

As to the correlations of achievement with the individual primary mental abilities, it is not surprising to note that the good readers tend to be superior to the other two groups in the factors involving verbal skill (*Vw*, *Vp*, *V*, and *Rw*). The increased cor-

relation between reading and the *Vp* factor is quite noticeable. That the ability to relate words and picture tends to improve during the eight months' interval between the two testing periods may be due to the fact that one of its important dimensions—the recognition of pictures—is a skill that children at this age have not completely mastered.

The children who achieve in arithmetic tend to show marked difference from the others in their superior performance on the PMA tests involving space perceptions and figure interpretation. The high spelling achievers tend to be more like the readers in their lack of ability to perceive and manipulate abstract spatial relationships mentally and to reason nonverbally. The relatively high correlations between spelling and number (*N*) is explained by the fact that the number test is a test of routine calculations, and hence utilizes similar skills to those required for good performance in spelling.

One further observation may be made regarding the good spellers' performance on the vocabulary tests (*V*, *Vw*). Although this level of performance on these tests was almost on a par with the good readers at the time of the first testing, it dropped considerably with the second testing, indicating that for them the skill of spelling may tend to become disassociated from the meaning of the words.

In general, the results of correlating academic achievement and mental ability confirms the expectation that a significant relation exists between these two sets of variables. This relation is not exhaustive and should not be interpreted to mean that intelligence, as measured by IQ tests, determines achievement test performance. This facile conclusion has unfortunately often been made on the basis of the observation of a positive correlation between performance on achievement tests and scores on the tests of mental ability—possibly because such tests as the Stanford-Binet were standardized on the basis of school grades. This view is indeed untenable in the light of our knowledge of the imperfect relation between IQ test scores and measures of achievement or performance. It is further invalidated by such findings as we have presented regarding the interrelation of both academic achievement and mental ability with personality traits.

In considering the interrelation of intelligence and performance, we suggest that thinking in terms of one active agent causing a change in another is much too simple. IQ tests usually attempt to measure something that could be called "innate potential," "facility for learning," or "intelligence"—in doing this the test makers try to eliminate reliance on previous experience or instruction. But obviously past experiences cannot be eliminated (or equated) completely. Furthermore, test-taking attitudes, temperament and personality factors, environmental and parental pressures all enter into the final test score. Thus, intelligence tests are very imperfect measures of "intelligence." Furthermore, academic achievement also is a complex function of "intelligence" and many other factors—motivation, environmental pressures and situations, test-taking facility, etc. Hence, academic achievement should not be viewed as the result of the mysterious genetic given that has been called "intelligence"; rather, both intelligence and achievement must be viewed as two complex aspects within a structure of interrelated situational and personal elements.

In summary, the results of this phase of our study may be viewed in the following ways:

1. The observed correlations between measures of mental ability and academic achievement are the result of an overlap in the two measures. Insofar as the intelligence tests measure those mental abilities that are related to academic success, and inasmuch as this measuring is done by means of acquired skills (not only linguistic and mathematical but also those pertaining to the art of test taking) it is expected that the two would show a high correlation. It is further noted that of the two tests of mental ability, the one that is more like the achievement tests in its format and its content correlates more highly with academic achievement.

2. The full meaning of the relation of mental ability and achievement appears only when we place them in the context of the total organization of experience; when we view them as related to each other and to a complex of other forces as parts of a dynamic field interacting and functioning together.

Concluding Remarks

The assumptions that academic achievement and intellectual abilities are associated with nonintellective factors, and that cognitive processes emerge within the personality organization of the individual and are meaningful in terms of his generalized effort to deal with his world as he sees it, were borne out by the findings of the present study. These results form another link in the chain of evidence that the personality is a stable configuration of dynamic processes, and is reflected and expressed in many diverse behaviors. The results of this study thus support the view that "learning," "memory," "intelligence," and "personality" are by no means isolated and independent processes, but rather they involve various expressions of the person's attempt to deal with and adapt to reality as he sees it.[9]

In relation to educational practices, the findings of this study suggest that: (*a*) personality variables should be included in any procedure designed to select and sponsor talented young persons for advanced training since the measured IQ alone does not distinguish between those who can and those who do achieve at a high level in particular academic areas; (*b*) consideration should be given to the ability and personality structures of the children who will do the learning in shaping situations to facilitate optimal learning and academic achievement; and (*c*) impediments to learning may be related to the individual's deepest motivating forces and to the early socialization pressures which help to shape his subsequent development. Ability to remove such impediments may require a thorough understanding of personality dynamics and the meaning such learning tasks have for the individual.

[9] As this research progresses, it may be possible to estimate the degree to which personality and mental ability measures contribute to academic achievement in this group of children.

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APPENDIX A

CHILD INTERVIEW

1. What do you like best about school?
2. What school subjects do you like best? (Restrict to academic.) Why? Which do you like least? Why?
3. What is the hardest subject for you? What is the easiest?
4. What is the most important thing to learn at school?
5. Which subject do you use most outside of school?
6. What things would you like to be able to do well?
7. When you have free time at school what do you like to do most?
8. What do you like to do best after school?
9. What games do you like to play best?
10. What is your favorite story?
11. What do you want to be when you grow up?
12. What do your parents want you to be?
13. If you had three wishes, what would they be?
14. How would you like to be different from how you are now?
15. If you could change and be another child, who would you like to be? Why?
16. What children do you like best in your class? Why?
17. Who is your best friend? If you had a secret, whom would you like to tell it to? Whom would you like to sit by? Play with?
18. Whom do you like least? Why?
19. What grown-up person do you like best? Who do you wish to be like when you grow up?
20. How do you like Miss X (teacher)?
21. What do you like best about her?
22. What does she do that you don't like? How would you like her to be different?
23. Do you think she likes you? Better than others? Does she like some other children better than you?
24. What do you like best about your home? What would you like to be different about it?
25. Are there some things you have to do at home that you don't like?
26. What things do you do with others at home that you like?
27. Which parent do you like to do things with best?
28. What do your parents think about your school work? How do they feel about your friends?
29. What do your parents do that makes you angry?
30. What do you get punished for? Who usually punishes you? How?
31. How much do you play with your brothers and sisters? How do you get along with them?
32. What do you and your brothers and sisters quarrel about? What usually happens?
33. Are there things that your brothers and sisters have that you would like to have? Are there things you wish you could do like them?

PARENT QUESTIONNAIRE

1. How does your child like third grade?
2. What interests him most at school?
3. What school subjects do you think he is best in?
4. What do you consider to be his outstanding abilities?
5. How do you think he feels about his abilities (as compared to the abilities of his brothers and sisters or playmates)?
6. What are his main interests outside school? How does he like to spend his free time? What activities outside school are planned for your child?
7. Which of his school subjects do you consider most important at this level?
8. What skills do you think he needs to acquire at this point?
9. What traits and attitudes are you most concerned in developing in your child?
10. What in particular do you want the Laboratory School to do for your child? How well do you think it is succeeding in this?
11. In what area do you think it has failed?
12. Please list the members of your household (include relatives, servants, etc.). Who has responsibility for your child's daily care?
13. What activities does he engage in with other members of the family? (Please check those that he enjoys most.)

Member of Family	*Activity*

14. What are some of the disciplinary problems that you have with him? How do you usually handle them?
15. What activities does he enjoy most with his brothers and sisters? How much time do they spend together? Who usually has the ideas when they play together?
16. How does he get along with his brothers and sisters?
17. What are the usual points of conflict among them? How are these settled?
18. What are the main areas of competition among them? Who is most successful?
19. What, if anything, have you done about this?
20. Please describe as fully as possible a typical day for your child.
21. Are there any additional comments that you would like to make about your child, his work at the Laboratory School, his interests, etc.?

APPENDIX B

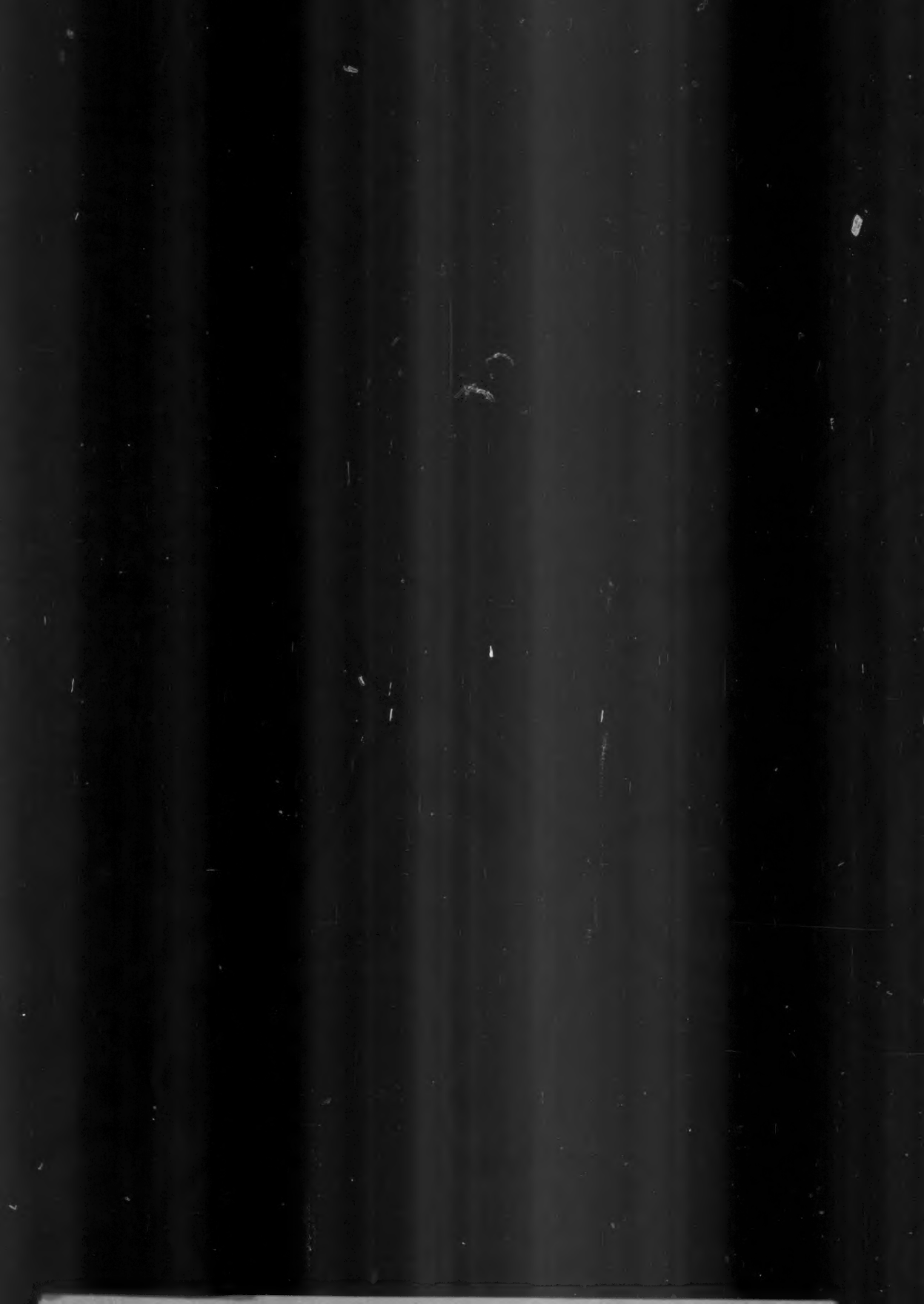
CORRELATIONS OF DISCREPANCY SCORES AND PERSONALITY VARIABLES

Personality Variables	Arithmetic		Reading		Spelling	
	Oct.	May	Oct.	May	Oct.	May
A. Observations						
2. Cooperative with teacher					.22	.28*
6. Popular with peers			−.19		.20	
8. Competitive	.31**				−.25*	
9. Hostile	.30**				−.30**	
10. Spontaneous	.24*	.22			−.29**	−.27*
11. Active	.32**				−.29**	−.20
12. Self-confident			−.28*			
13. Relaxed			−.22		.19	
14. Bids for attention	.22				−.26*	−.26*
15. Persistent				−.20	.18	.23*
16. Neat				−.31**	.28*	.42**
17. Warm and affectionate parents					.18	.18
20. Warm toward siblings						−.19
21. Likes arithmetic	.26*	.31**			−.17	−.29**
22. Likes reading		−.18		.50**		−.31**
23. Likes spelling		−.18		−.24*	.35**	.42**
25. Likes shop	.30**	.29**	−.25*			
27. Likes gym						−.18
B. Children's Apperceptive Test						
5. Abstract concepts			.19		−.20	−.23*
6. Whole approach	−.18		.38**	.24*		
7. Ego strength		.20			−.18	
14. Rejection						−.18
17. Fear of oral deprivation			.24*			
18. Anal concern	.21				−.30**	
19. Genital sex concern				.22		−.25*
C. Rorschach						
1. Abstract approach				.32**		−.23*
2. Originality	−.19					
3. Spontaneity			.27*	.24*		−.18
4. Activity			.24*	.20		
6. Introversive M:C		−.18				
10. Compulsivity			−.18	−.33**		
11. Aggression	.19				−.28*	−.18

Note.—Only the variables with a correlation of .18 or higher are included.
* Significant at .05 level.
** Significant at .01 level.

APPENDIX C

COMPARISON OF GROUPS SHOWING DIFFERENT PATTERNS OF ACHIEVEMENT

Personality Variable	Level of Significance of Chi Squares					
	HA-LR v. LA-HR		HA-LS v. LA-HS		HR-LS v. LR-HS	
	Oct.	May	Oct.	May	Oct.	May
A. Observations						
1. Dependent on teacher						−.10
2. Cooperative with teacher		.07	−.10	−.08	−.10	−.08
3. Warm toward teacher	.10				−.10	
4. Group leader	.10	.10				.05
6. Popular with peers	.20	.12	−.10		−.07	
7. Dependent on peers		−.03	−.05	−.07	−.10	
8. Competitive					.10	
9. Hostile			.03	.09		
10. Spontaneous	.20		.02			.03
11. Active	.08		.04			
12. Self-confident		.10				.10
13. Relaxed				.05		
14. Bids for attention						.07
15. Persistent	.05	.03			−.08	
16. Neat	.10	.15	−.06	−.05	−.06	−.01
19. Parents exert pressure for achievement			.02			
20. Warm toward siblings			.20	.15	−.10	−.05
21. Likes arithmetic			.07	.05	−.05	
22. Likes reading				.05		.01
23. Likes spelling			−.10	−.10	−.05	−.01
24. Likes art					.05	.10
25. Likes shop		.07				
27. Likes gym			.10			
B. Children's Apperceptive Test						
3. Coherence of plot				.15		.10
5. Abstract concepts			.10	.05	.05	.03
6. Whole approach	−.10	−.10	.06	.02	.07	.03
10. Compulsivity	−.10	−.10				
11. Free-floating anxiety					.05	.05
12. Helplessness in adult world	−.05	−.08			−.10	−.06
13. Guilt feelings				.10	.10	
14. Rejection			.10	.10		.10
15. Aggression	.05		.05			
17. Fear of oral deprivation		−.05				
19. Genital sex concern	−.10					
20. Positive reactions to mother		.18				
22. Competitiveness with siblings	−.10	−.15				
24. Grammatical level			.07	.05	.05	.05
C. Rorschach						
1. Abstract approach				−.08		.05
3. Spontaneity						.05
4. Activity	.10			.10		
6. Introversion M:C	−.05	−.13			.08	.05
8. Inhibited emotional response		.10				
10. Compulsivity		−.10		−.15	−.10	
11. Aggression			.01	.05		
13. Genital sex concern	−.10					

Note.—To save space only p values of .20 or less are given.